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1. Models described

These repair instructions describe how to repair the following models:

Model	Order number
GSZ 8-280P	7 223 16
GSZ 8-280PE	7 223 17
GSZ 8-280PL	7 223 18
GSZ 8-280PEL	7 223 19
GSZ 8-90PEL	7 223 20



2. Technical data

Technical data

All the technical data can be found in the operating instructions for the model.

Tests

Up-to-date test data and test instructions after repair can be found on the FEIN Extranet (Customer Service → Repair Guides).

Lubricants / Auxiliary substances

The lubricants or auxiliary substances and their container sizes available from FEIN can be found on the FEIN Extranet (Customer Service → Repair Guides).

Lists of spare parts

Lists of spare parts and exploded views are available online at www.fein.com



3. Notes and requirements

Please note

These instructions are only intended for persons with suitable technical training. It is assumed that the reader has mechanical and electrical training.

Only use original FEIN spare parts.

Provisions

Please note that power tools may only be repaired, maintained and checked by a trained electrician, as improper repair can result in serious risks to the user.

The provisions set out in **DIN VDE 0701-0702** should be observed after repairs.

The relevant accident prevention regulations of the employer's liability insurance associations are to be observed when commissioning.

The German Equipment and Product Safety Act [ProdSG] applies for correct use.

Outside Germany, the regulations applicable in the relevant country must be observed.



4. Tools required

Standard tools

Plastic hammer	
Slotted screwdriver	
Slotted screwdriver (small)	
Torx	T15
Punch	5 mm
Arbor press	
Long-nosed pliers	
4x round material	Diameter 20 mm; length = 60 mm
Vice	
Open-ended spanner	13 mm; 17 mm; 30 mm
Circlip pliers	
Socket head wrenches	3 mm
Inner puller	
Slide hammer	
Flat material	45 mm x 20 mm x 5 mm
Arbor	13 mm diameter

Special tools

Drawing-off socket cap	6 41 04 150 00 8
Chuck cone 19 mm	6 41 07 019 00 7
Assembly aid	6 41 22 121 01 0
Pressure piece	6 41 22 003 00 0



4. Tools required

Standard tools

Sleeve	20 mm inner diameter
	32 mm outer diameter
	21 mm inner diameter
	26 mm outer diameter
	16 mm inner diameter
	31 mm outer diameter
	11 mm inner diameter
	16 mm outer diameter
	10 mm inner diameter
	25 mm outer diameter
	8 mm inner diameter
	19 mm outer diameter
	8 mm inner diameter
	12 mm outer diameter
	80 mm inner diameter
	90 mm outer diameter
	20 mm inner diameter
	26 mm outer diameter
	9 mm inner diameter
	21 mm outer diameter



5. Lubricants and auxiliary substances required

Lubricants

GSZ 8-280PL, GSZ 8-280PEL

Oil (acid-free)

Felt ring

GSZ 8-280P, GSZ 8-280PE, GSZ 8-280PL, GSZ 8-280PEL

These machines do not require any grease.

GSZ 8-90PEL

Grease

0 40 101 01 00 4

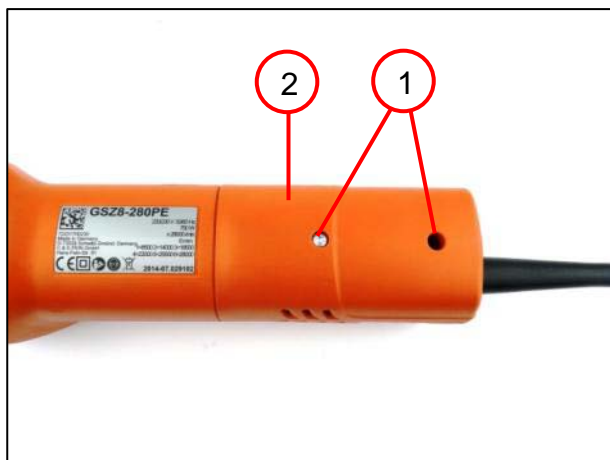
13 g

Gearbox



6. Removal

Removing the cover



1. Unscrew the two screws (1).
2. Remove the lower part of the cover (2).

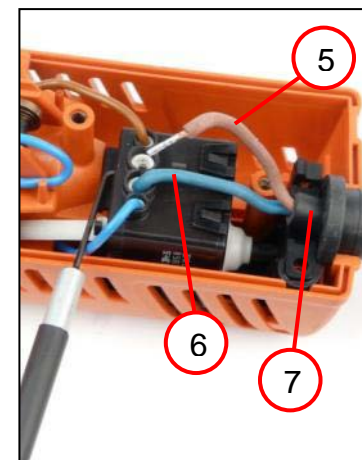
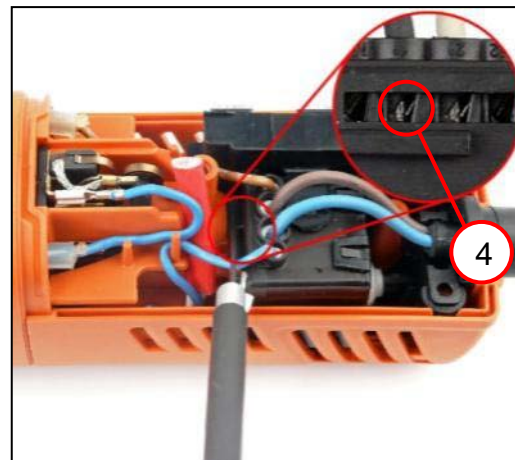
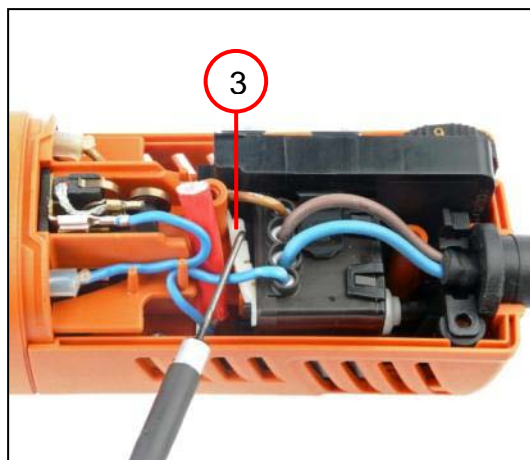
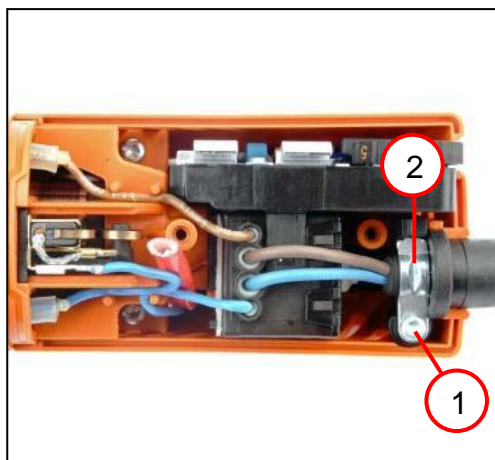
Tools:

- Torx T15



6. Removal

Replacing the mains cable



1. Unscrew the screw (1).
2. Remove the cable clamp (2).
3. Pull off the cover (3).
4. Slide the assembly aid into the opening (4).
5. Turn the assembly aid and take out the cable (5).
6. Take out the cable (6).
7. Remove the cable with plug (7).

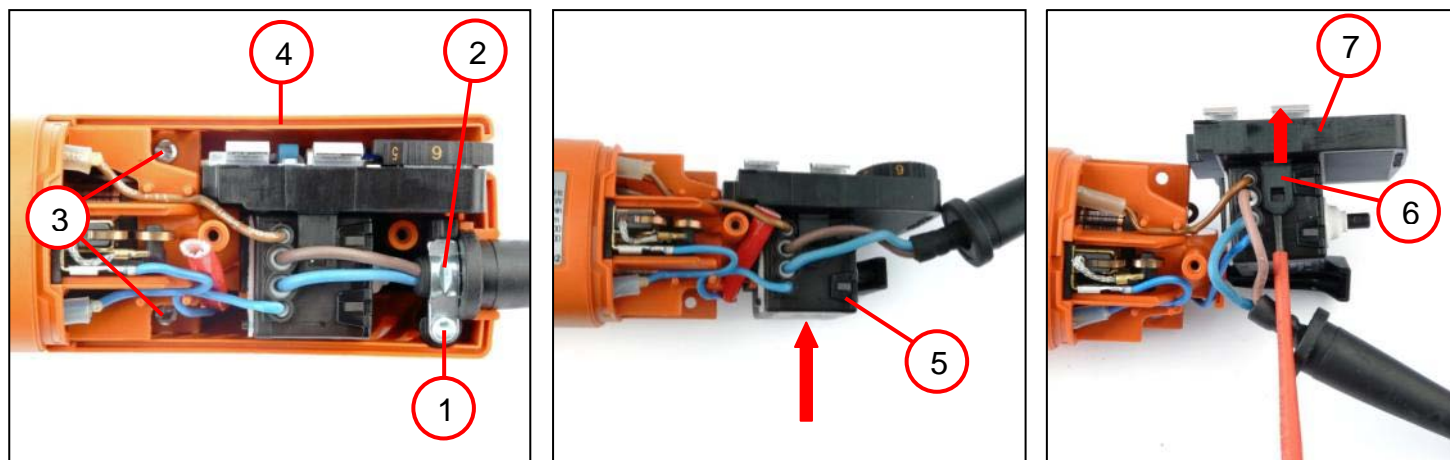
Tools:

- Torx T15
- Assembly aid



6. Removal

Removing the switch



1. Unscrew the screw (1).
2. Remove the cable clamping piece (2).
3. Unscrew the two screws (3)
4. Remove the upper part of the cover (4).
5. Take out the control rod.
6. Slide the switch (5) out of the holder.
7. Lift and hold the lock (6) of the switch [on both sides].
8. Pull off the electronics (7).

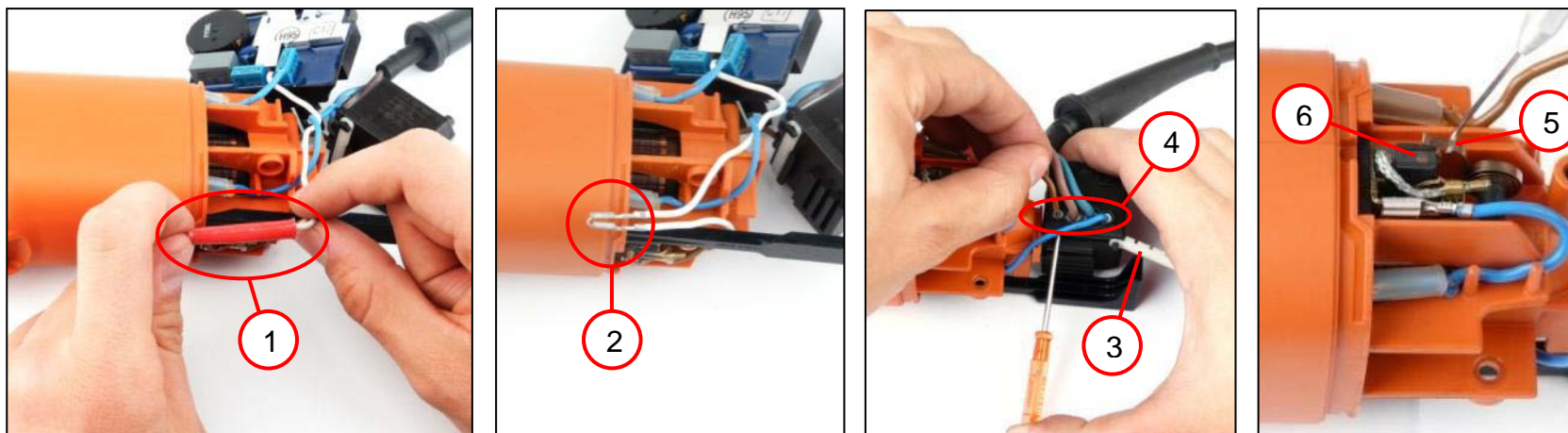
Tools:

- Torx T15
- Slotted screwdriver



6. Removal

Removing the switch



1. Remove the insulating hose (1).
2. Pull the stranded wire of the contact spring off the stranded wire of the electronics (2).
3. Open the cover (3).
4. Insert a small slotted screwdriver into the spring terminals and turn.
5. Remove the four cables (4).
6. Lift up the tension spring (5) from the carbon brush (6) [on both sides].
7. Pull out the carbon brush (6) [on both sides].

Tools:

- Slotted screwdriver (small)
- Assembly aid



6. Removal

Removing the collar bearing



1. Unscrew the four screws (1).

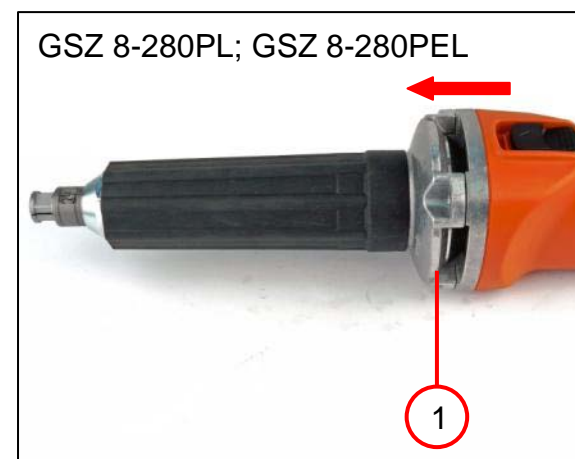
Tools:

- Torx T15



6. Removal

Removing the collar bearing



1. Pull the collar bearing (1) out of the housing.



6. Removal

Removing the stator



1. Remove the air guide ring (1).
2. Remove the slide switch (2).
3. Pull off the cable on the brush holder [on both sides].
4. Remove the brush holder (3).
5. Pull out the control rod (4).

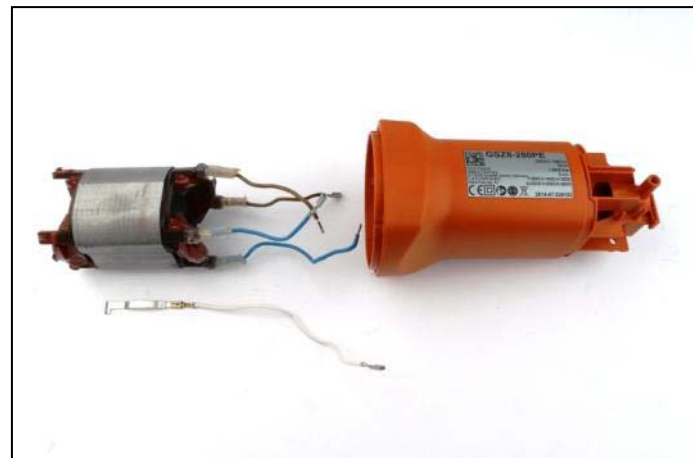
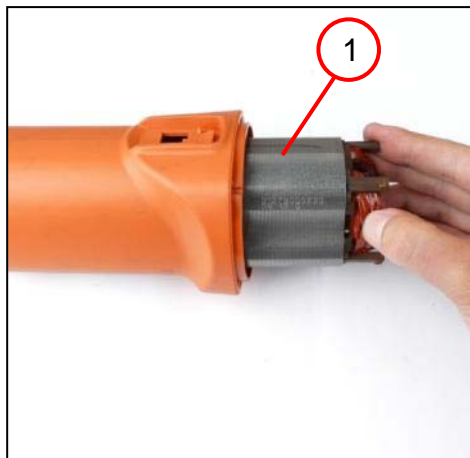
Tools:

- Slotted screwdriver
- Long-nosed pliers



6. Removal

Removing the stator



1. Remove the stator (1).

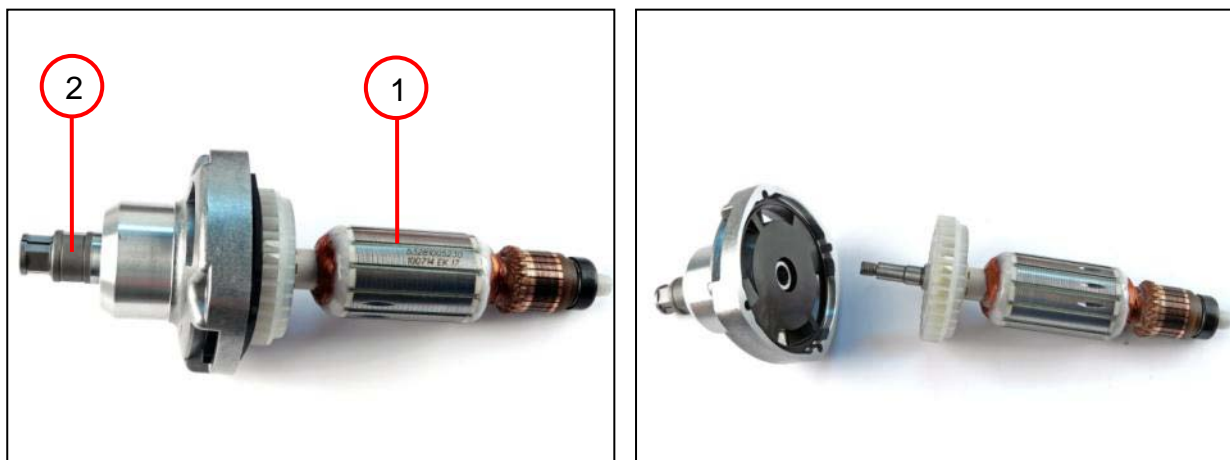
Tools:

- Plastic hammer



6. Removal

Removing the armature (applies to: GSZ 8-280P; GSZ 8-280PE)



1. Unscrew the armature (1) out of the shaft (2).

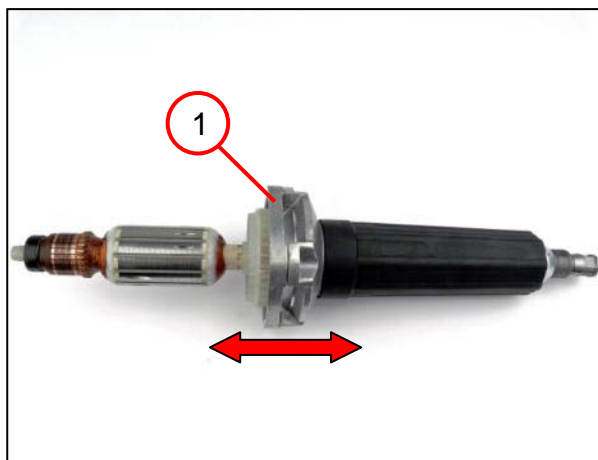
Tools:

- Open-ended spanner
17 mm



6. Removal

Removing the armature (applies to: GSZ 8-280PL; GSZ 8-280PEL)



1. Pull the intermediate gearbox with armature (1) off the collar bearing.
2. Unscrew the clutch part (2).
3. Press the armature (3) out of the intermediate gearbox.

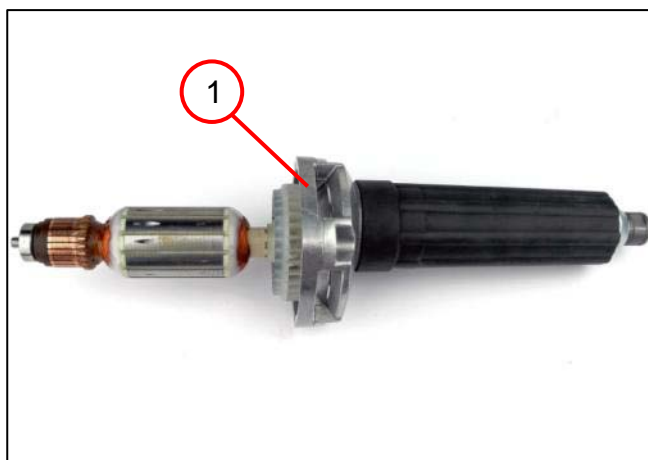
Tools:

- Arbor press
- Punch 5 mm
- Sleeve
80 mm inner diameter
90 mm outer diameter



6. Removal

Removing the armature (applies to: GSZ 8-90PEL)



1. Pull the intermediate gearbox with armature (1) off the collar bearing.
2. Remove the seal (2).
3. Press the armature with the sealing ring (3) out of the intermediate gearbox.

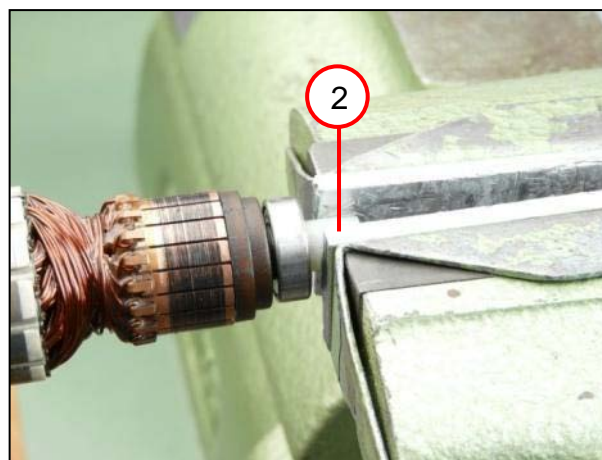
Tools:

- Arbor press
- Sleeve
80 mm inner diameter
90 mm outer diameter



6. Removal

Removing the armature



1. Remove the rubber socket (1).
2. Pull off the magnet (2)
☞ The magnet is destroyed during removal and must be replaced.
3. Pull off the grooved ball bearing (3).

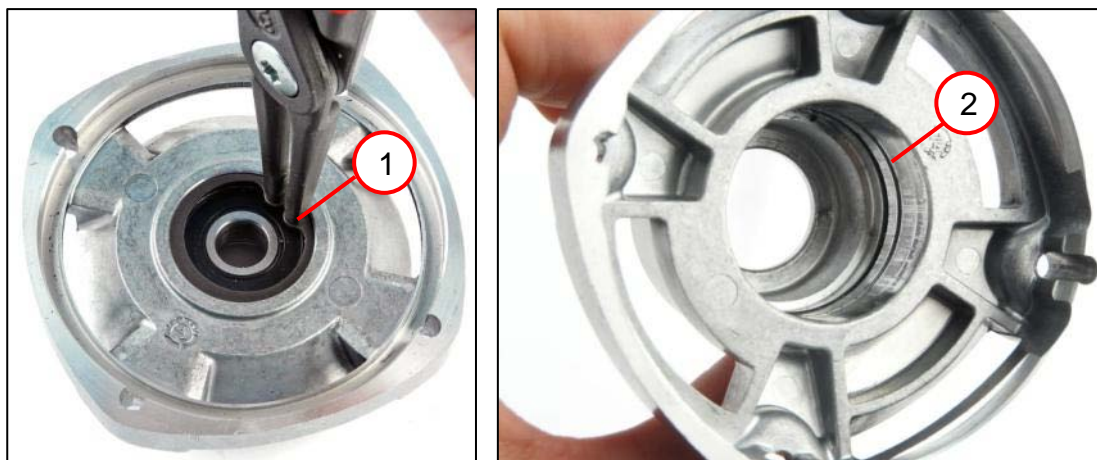
Tools:

- Vice
- Drawing-off socket cap
- Chuck cone 19 mm



6. Removal

Removing the intermediate gearbox (applies to: GSZ 8-280PEL; GSZ 8-280PEL; GSZ 8-90PEL)



1. Remove the circlip (1).
2. Press the grooved ball bearing out of the intermediate gearbox.
3. Remove the sealing ring (2).
 - ☞ The sealing ring is destroyed during removal and must be replaced.

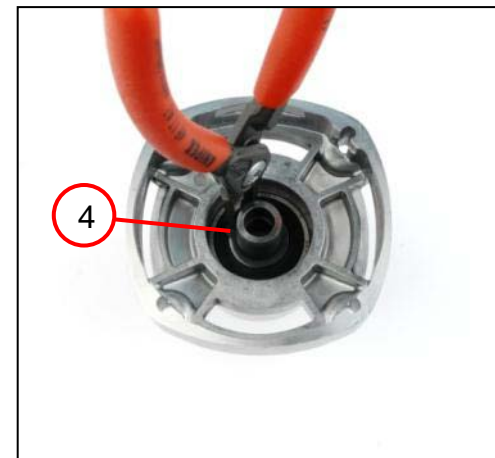
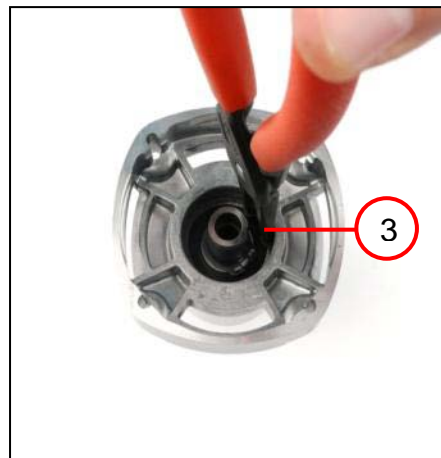
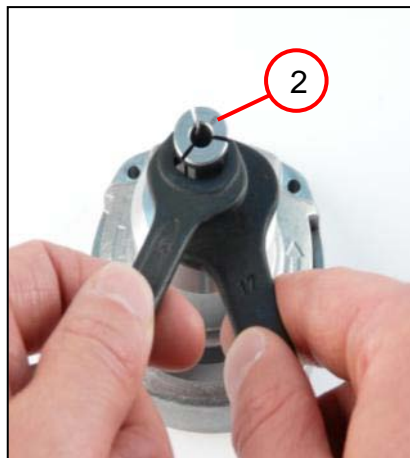
Tools:

- Arbor press
- Circlip pliers
- Arbor with 13 mm diameter



6. Removal

Removing the collar bearing (applies to: GSZ 8-280PE; GSZ 8-280PE)



1. Remove air guide ring (1).
2. Remove the collet (2).
3. Remove the circlip (3) on the shaft.
4. Remove the circlip (4) on the collar bearing.

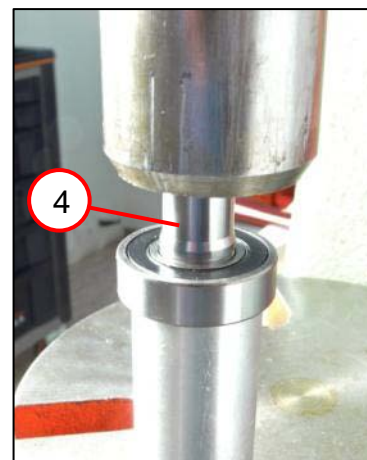
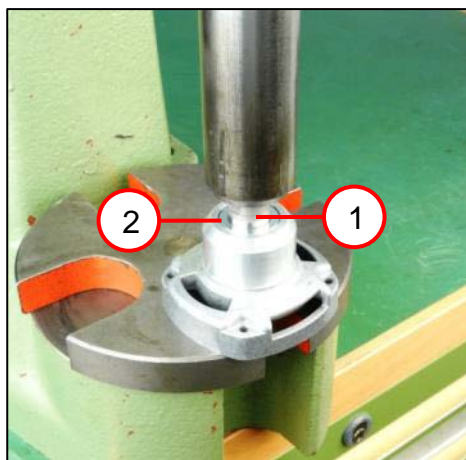
Tools:

- Open-ended spanner 13 mm
- Open-ended spanner 17 mm
- Circlip pliers



6. Removal

Removing the collar bearing (applies to: GSZ 8-280PE; GSZ 8-280PE)



1. Press out the drive shaft (1).
2. Remove the ring (2).
3. Remove the sealing ring (3).
 - ☞ The sealing ring is destroyed during removal and must be replaced.
4. Press the grooved ball bearing off the shaft (4).

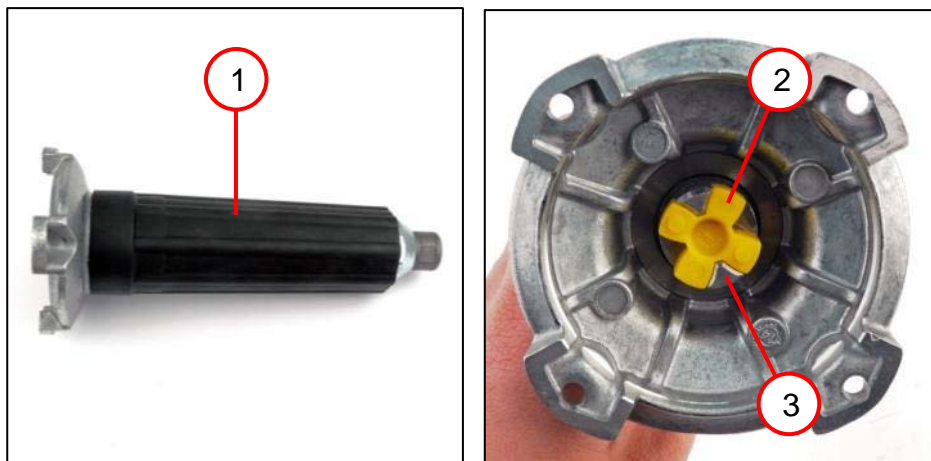
Tools:

- Arbor press
- Sleeve
20 mm inner diameter
32 mm outer diameter



6. Removal

Removing the collar bearing (applies to: GSZ 8-280PL; GSZ 8-280PEL)

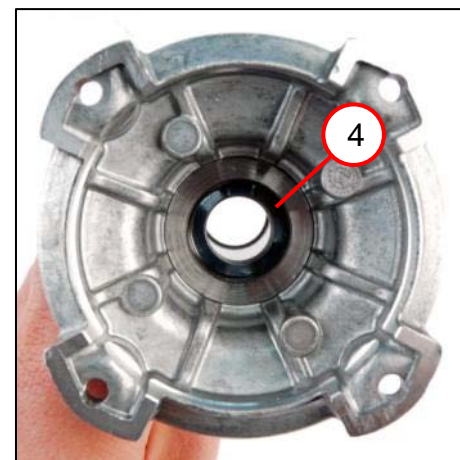
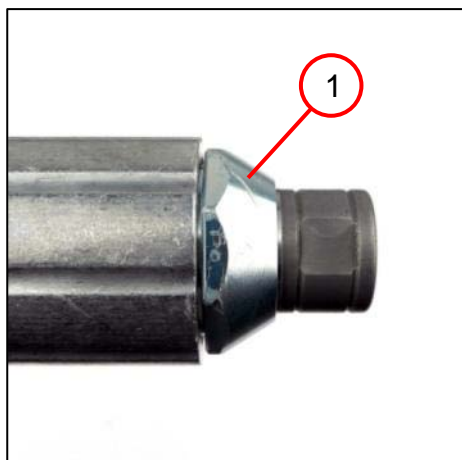


1. Pull off the protective hose (1).
2. Remove the clutch part (2).
3. Unscrew the clutch part (3).



6. Removal

Removing the collar bearing (applies to: GSZ 8-280PL; GSZ 8-280PEL)



1. Unscrew the sleeve (1) [left-handed thread].
2. Press out the shaft (2).
3. Remove the grooved ball bearing (3).
4. Remove the washer (4).

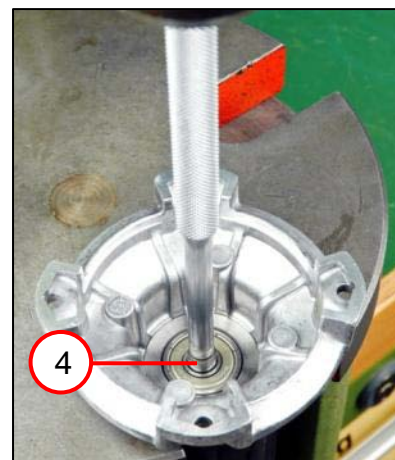
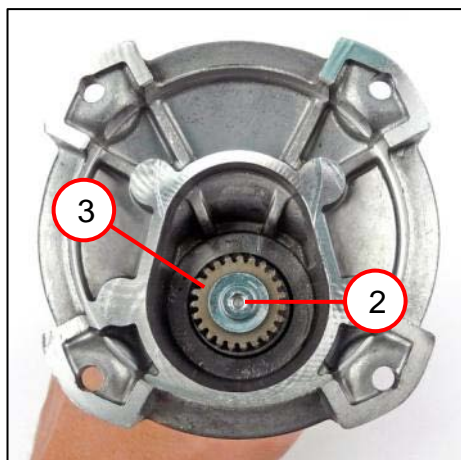
Tools:

- Spanner 30 mm
- Arbor press
- Punch 5 mm
- Inner puller
- Slide hammer



6. Removal

Removing the collar bearing (applies to: GSZ 8-90PEL)



1. Unscrew the sleeve (1) [left-handed thread].
2. Unscrew the screw (2) and remove it together with the disc.
3. Remove the gear-wheel (3).
4. Press out the shaft (4).

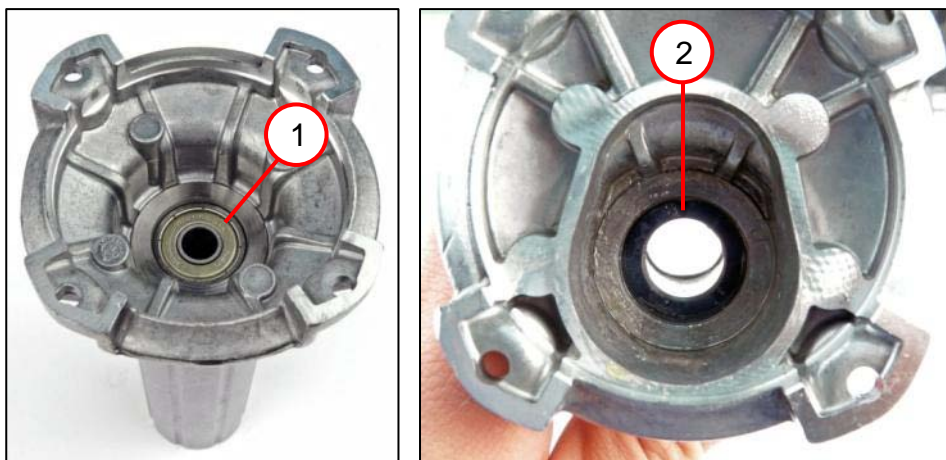
Tools:

- Socket head wrench 3 mm
- Spanner 17 mm
- Spanner 30 mm
- Arbor press
- Punch 5 mm



6. Removal

Removing the collar bearing (applies to: GSZ 8-90PEL)



1. Remove the grooved ball bearing (1).
2. Remove the washer (2).

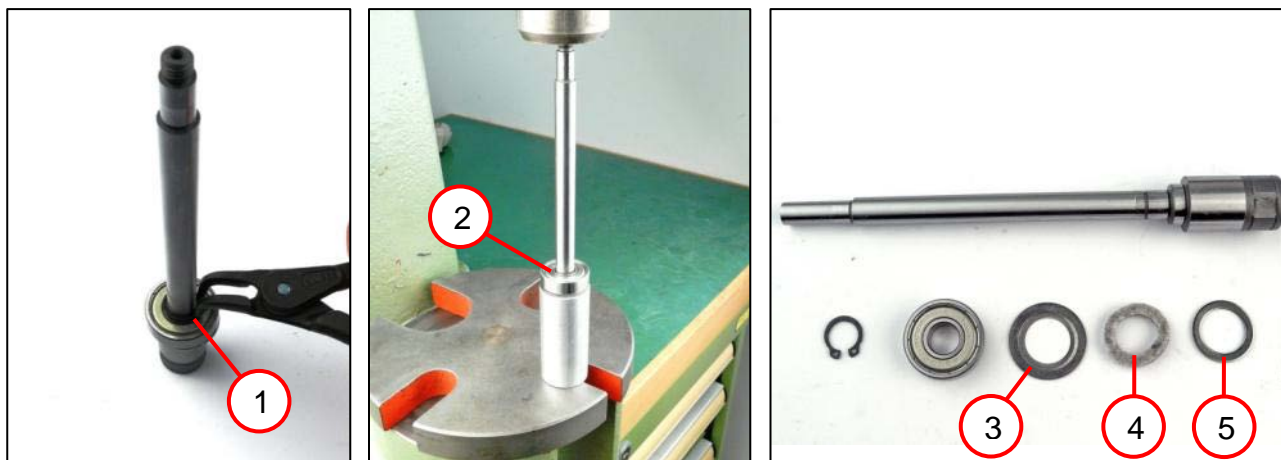
Tools:

- Inner puller
- Slide hammer



6. Removal

Removing the shaft (applies to: GSZ 8-280PL; GSZ 8-90PEL; GSZ 8-280PEL)



1. Remove the circlip (1).
2. Press off the grooved ball bearing (2).
3. Remove the disc (3).
4. Remove the felt ring (4).
5. Remove the disc (5).

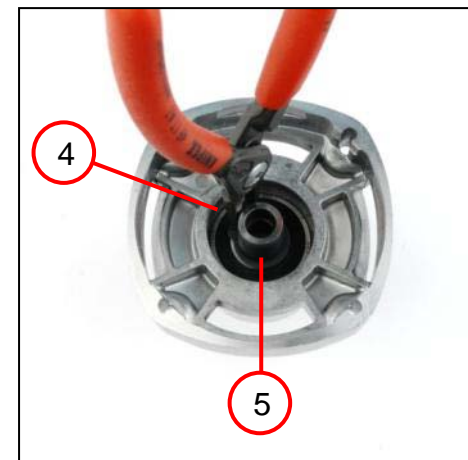
Tools:

- Arbor press
- Sleeve
21 mm inner diameter
26 mm outer diameter
- Circlip pliers



7. Fitting

Fitting the collar bearing (applies to: GSZ 8-280P; GSZ 8-280PE)



1. Press the drive shaft (1) into the grooved ball bearing.
2. Insert the sealing ring (2).
3. Press the drive shaft into the collar bearing (3).
4. Insert the circlip (4) into the collar bearing.
5. Place the circlip (5) on the drive shaft.

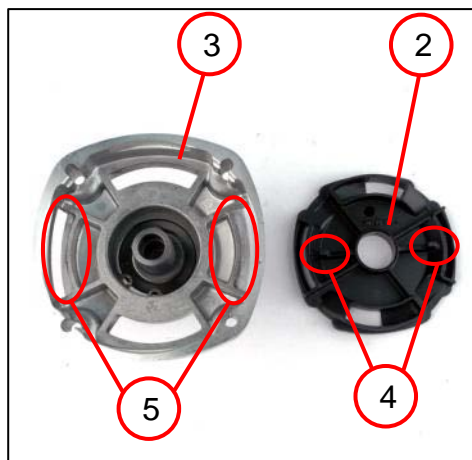
Tools:

- Arbor press
- Sleeve
15 mm inner diameter
31 mm outer diameter
- Circlip pliers



7. Fitting

Fitting the collar bearing (applies to: GSZ 8-280P; GSZ 8-280PE)



1. Press in the ring (1).
2. Insert the air guide ring (2) into the collar bearing (3).
 - ☞ Place the two locks (4) in the recess (5).

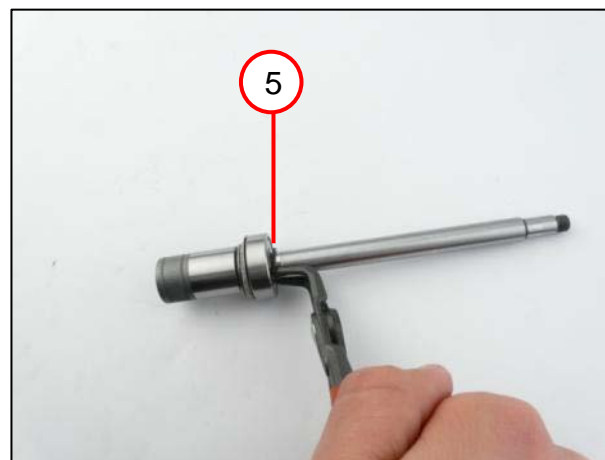
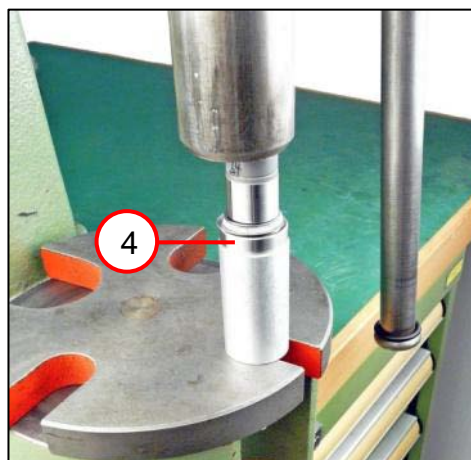
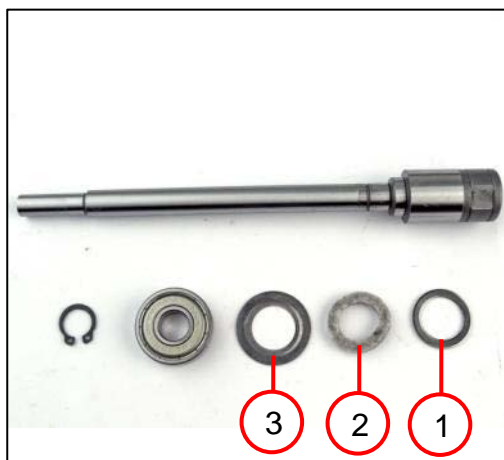
Tools:

- Arbor press
- Sleeve
20 mm inner diameter
26 mm outer diameter



7. Fitting

Fitting the shaft (applies to: GSZ 8-90PL; GSZ 8-90PEL; GSZ 8-280PEL)



1. Insert the disc (1).
2. Soak the felt ring (2) with oil.
3. Insert the felt ring (2).
4. Insert the disc (3).
5. Press in the grooved ball bearing (4).
6. Insert the circlip (5).

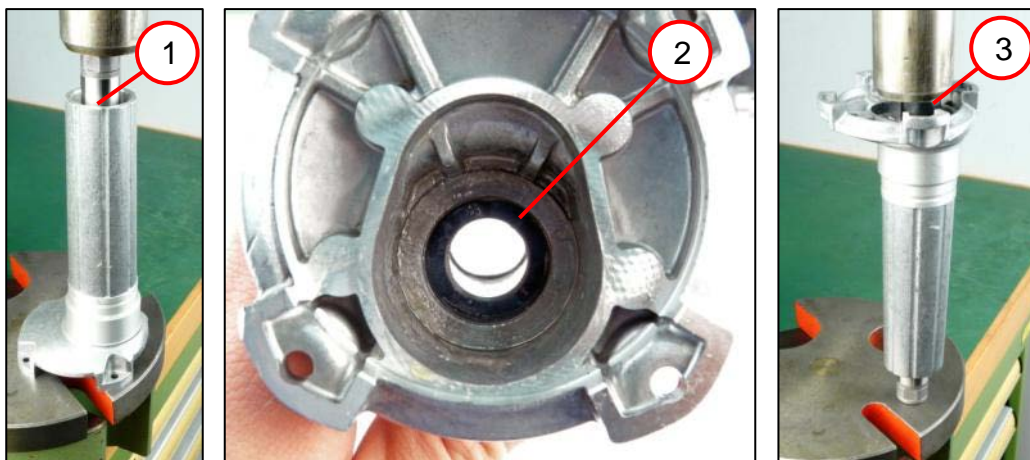
Tools:

- Arbor press
- Sleeve
11 mm inner diameter
16 mm outer diameter
- Circlip pliers
- Oil



7. Fitting

Fitting the collar bearing (applies to: GSZ 8-90PL; GSZ 8-90PEL; GSZ 8-280PEL)



1. Press the shaft (1) into the collar bearing.
2. Insert the disc (2).
3. Press in the grooved ball bearing (3).

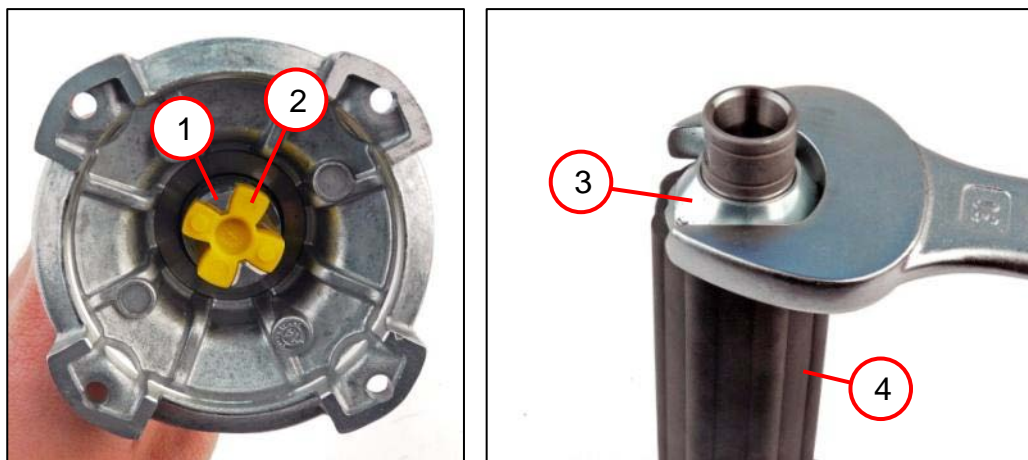
Tools:

- Arbor press
- Sleeve
9 mm inner diameter
21 mm outer diameter



7. Fitting

Fitting the collar bearing (applies to: GSZ 8-280PL; GSZ 8-280PEL)



1. Screw the clutch part (1) hand-tight onto the shaft.
2. Insert the clutch part (2).
3. Screw down the protective sleeve (3) [left-handed thread] [$12^{+1.0}$ Nm].
4. Slide the protective hose (4) onto the collar bearing.

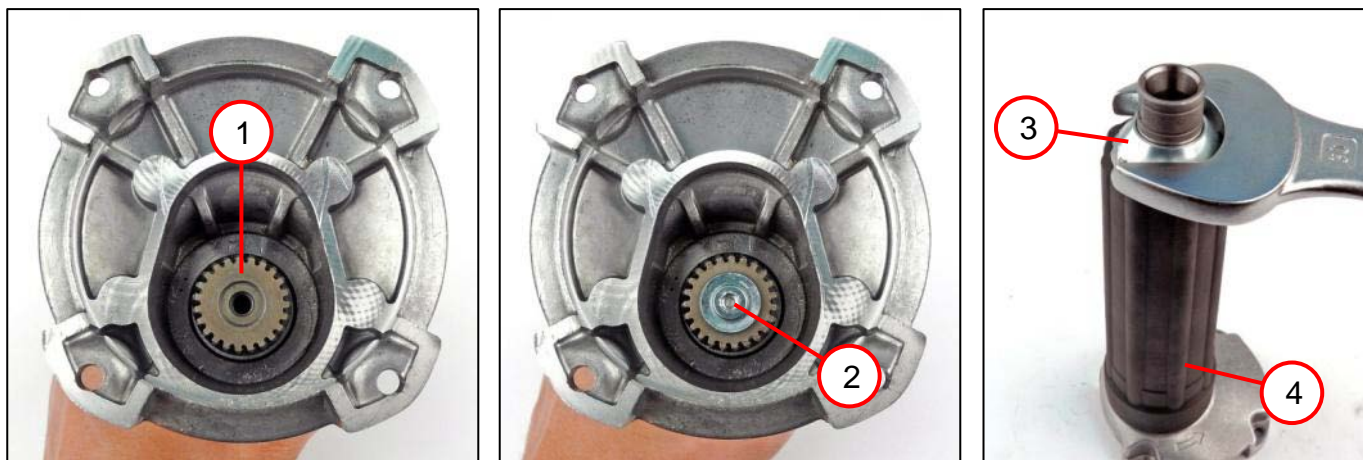
Tools:

- Spanner
17 mm; 30 mm
- Flat material 45 mm x
20 mm x 5 mm



7. Fitting

Fitting the collar bearing (applies to: GSZ 8-90PEL)



1. Attach the gear-wheel (1).
2. Fit the disc and screw in the cylinder head screw (2) [1.2 Nm].
3. Screw down the sleeve (3) [left-handed thread] [$12^{+1.0}$ Nm].
4. Slide the protective hose (4) onto the collar bearing.

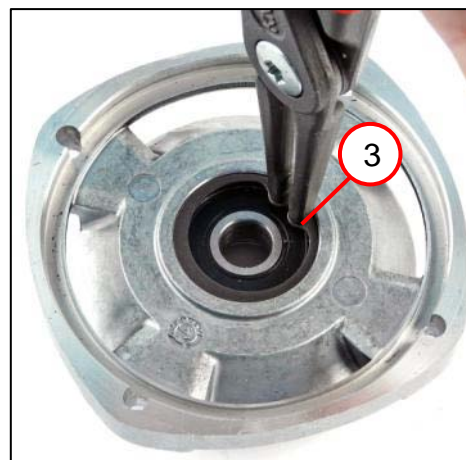
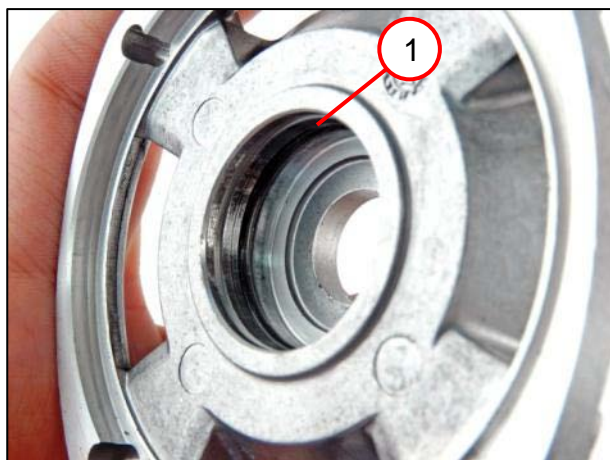
Tools:

- Socket head wrench
3 mm
- Spanner
17 mm; 30 mm



7. Fitting

Fitting the intermediate gearbox (applies to: GSZ8-280PL; GSZ8-280PEL; GSZ8-90PEL)



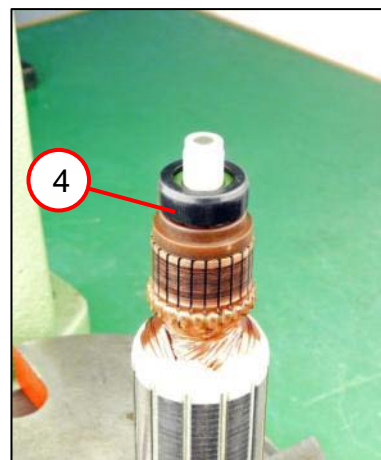
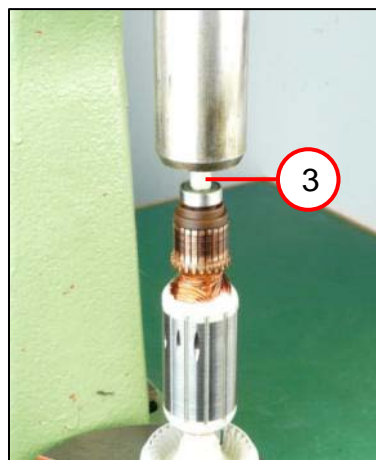
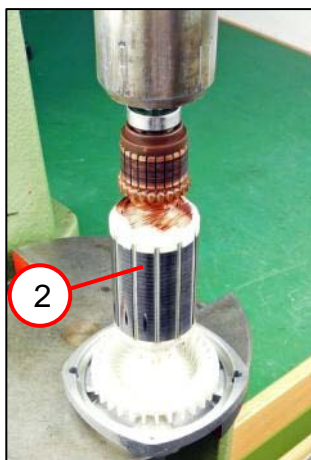
1. Insert the sealing ring (1).
2. Press in the grooved ball bearing (2).
3. Insert the circlip (3).

Tools:

- Arbor press
- Sleeve
10 mm inner diameter
25 mm outer diameter

7. Fitting

Fitting the armature (GSZ 8-280PE; GSZ 8-280PL; GSZ 8-280PEL)



1. Press the grooved ball bearing (1) onto the armature.
2. Press the armature into the intermediate gearbox (2).
3. Press the magnet (3) onto the armature.
☞ The magnet must be replaced each time the armature is fitted.
4. Slide the bearing bush (4) onto the grooved ball bearing.

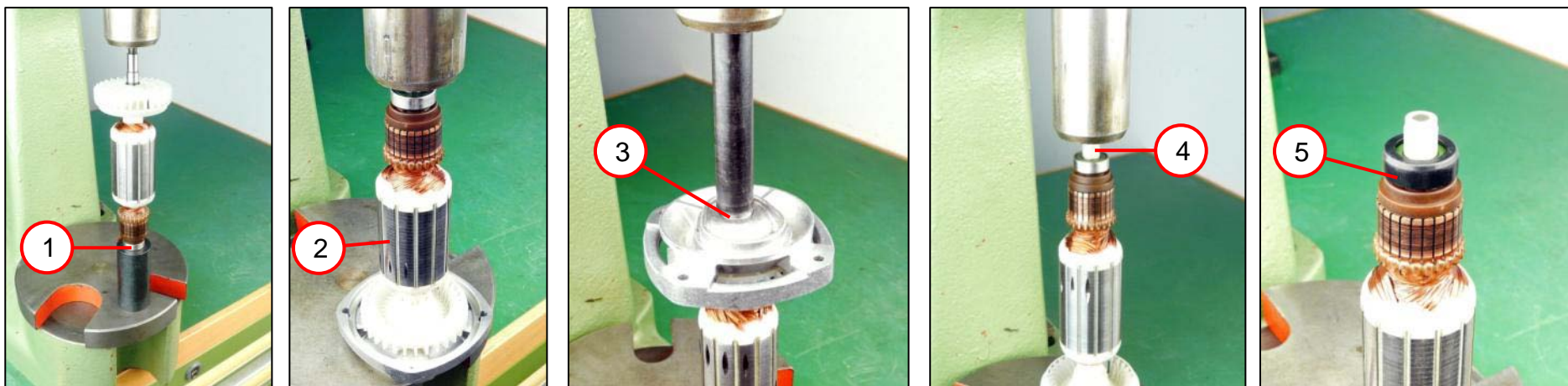
Tools:

- Arbor press
- Sleeve
8 mm inner diameter
19 mm outer diameter



7. Fitting

Fitting the armature (GSZ 8-90PEL)



1. Press the grooved ball bearing (1) onto the armature.
2. Press the armature into the intermediate gearbox (2).
3. Press the sealing ring (3) onto the armature.
4. Carefully press the magnet (4) onto the armature.
 ☞ The magnet must be replaced each time the armature is fitted.
5. Slide the bearing bush (5) onto the grooved ball bearing.

Tools:

- Arbor press
- Sleeve
8 mm inner diameter
19 mm outer diameter
- Sleeve
8 mm inner diameter
12 mm outer diameter



7. Fitting

Fitting the armature (GSZ 8-280PE)

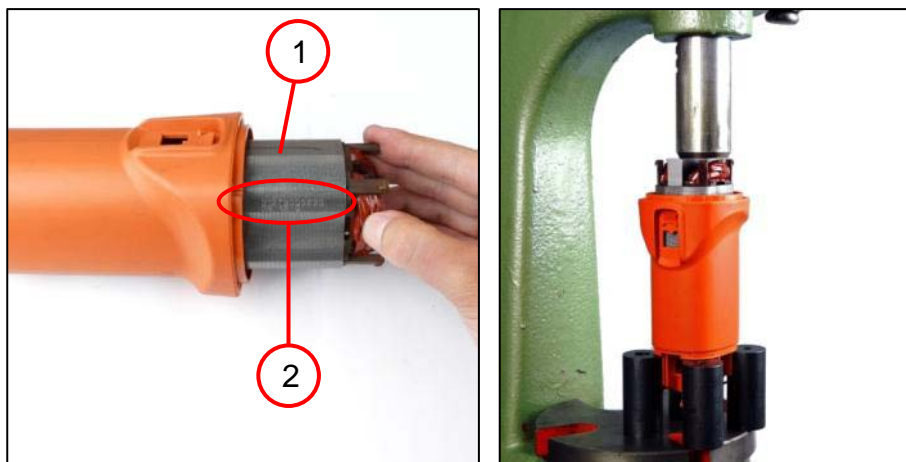


1. Slide the bearing bush (1) onto the grooved ball bearing.
2. Screw the armature into the collar bearing (2).



7. Fitting

Fitting the stator



1. Press the stator (1) into the motor housing in the correct position.
☞ Use the ID number (2) to align the stator.

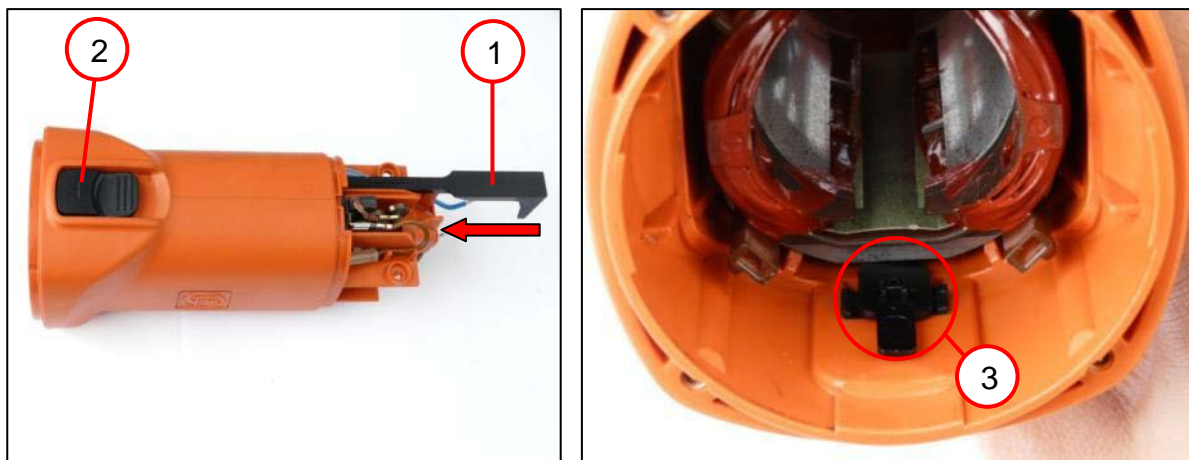
Tools:

- Arbor press
- Pressure piece
- 4x round material
20 mm in diameter;
length = 60 mm



7. Fitting

Fitting the stator

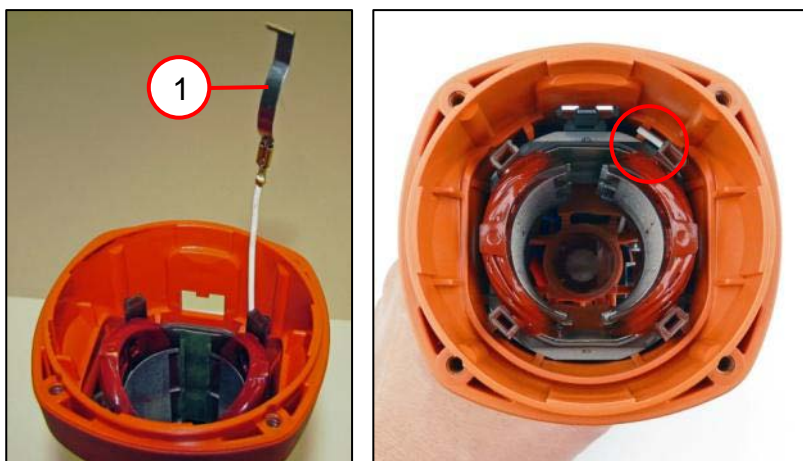


1. Slide the control rod (1) into the motor housing.
2. Clip the slide switch (2) into the control rod.



7. Fitting

Fitting the contact spring



1. Insert the contact spring (1) into the motor housing in the correct position.



7. Fitting

Fitting the air guide ring

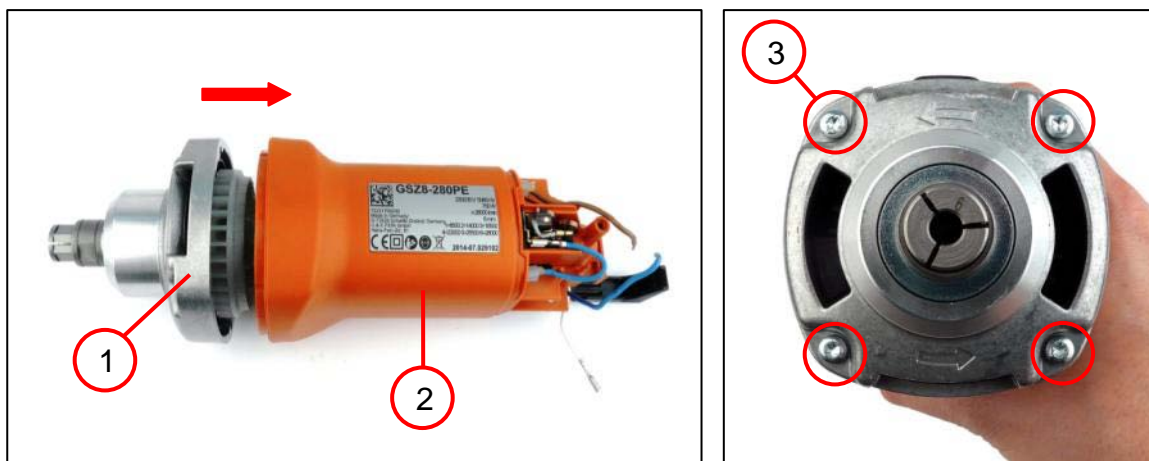


1. Insert the air guide ring (1) into the motor housing.



7. Fitting

Fitting the collar bearing (GSZ 8-280PE)



1. Slide the collar bearing (1) with armature into the motor housing (2).
2. Screw in the four screws (3) [2.7 Nm].

Tools:

- Torx T15



7. Fitting

Fitting the collar bearing (applies to: GSZ 8-280PL; GSZ 8-280PEL)



1. Screw the clutch part (1) onto the armature.

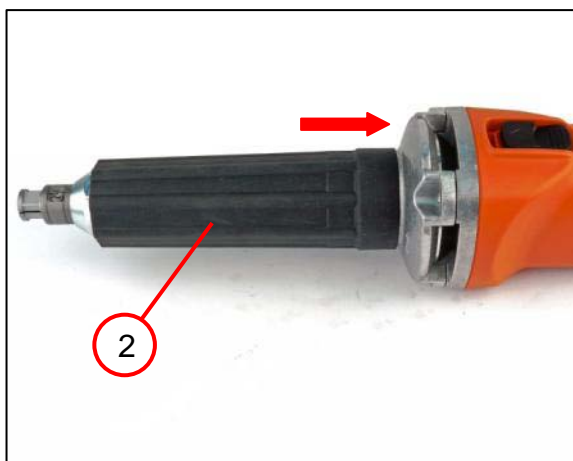
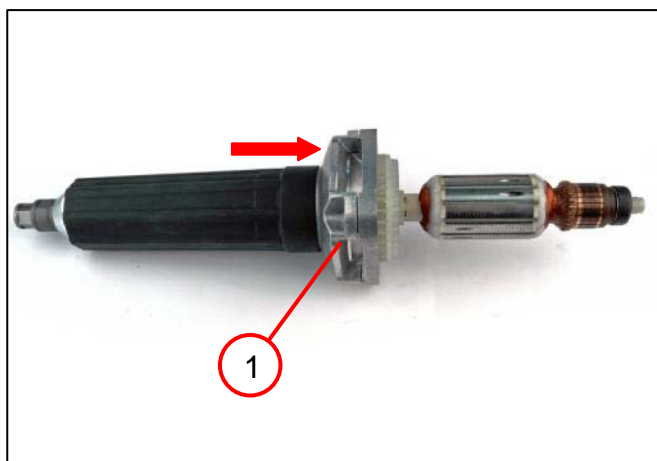
Tools:

- Torx T15



7. Fitting

Fitting the collar bearing (applies to: GSZ 8-280PL; GSZ 8-280PEL)



1. Put the collar bearing (1) with clutch part onto the intermediate gearbox.
2. Slide the collar bearing (2) with intermediate gearbox and armature into the motor housing.
3. Screw in the four screws (4) [2.7 Nm].

Tools:

- Torx T15

7. Fitting

Fitting the collar bearing (applies to: GSZ 8-90PEL)

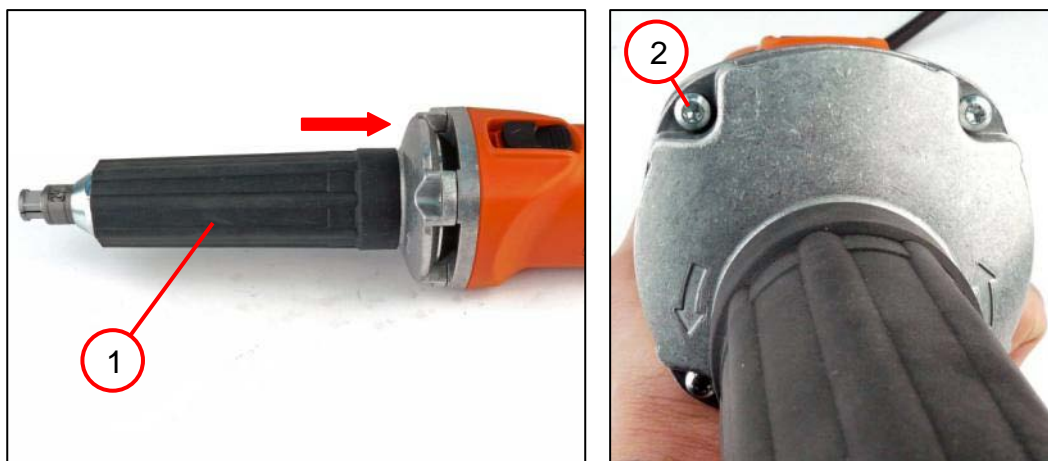


1. Place the seal (1) on the intermediate gearbox.
🔧 Always use a new seal during each fitting.
2. Fill the collar bearing with 13 g of grease.
3. Put the collar bearing (2) on the intermediate gearbox.



7. Fitting

Fitting the collar bearing (applies to: GSZ 8-90PEL)



1. Slide the collar bearing (1) with intermediate gearbox and armature into the motor housing.
2. Screw in the four screws (2) [2.7 Nm].

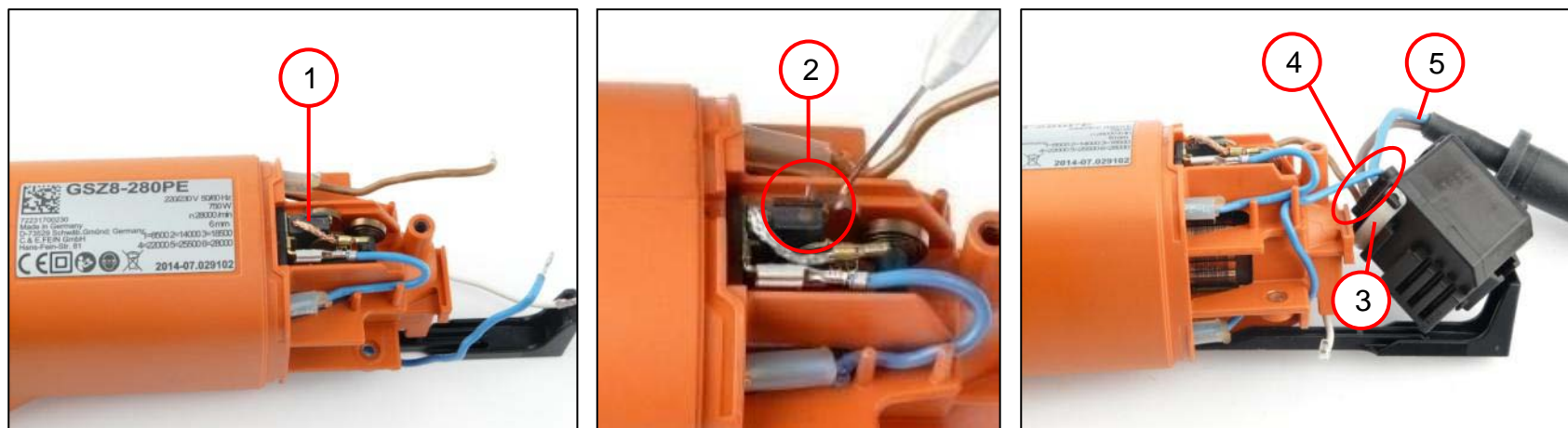
Tools:

- Torx T15



7. Fitting

Fitting the switch and electronics



1. Fit the carbon brush (1) and connect it as shown in the connection diagram [on both sides].
 2. Place the spring (2) of the carbon brush holder on the carbon brush [on both sides].
 3. Close the cover (3) on the switch.
 4. Connect the cables (4) and (5).
- ☞ See the “Connection diagram” chapter for connecting the cables.

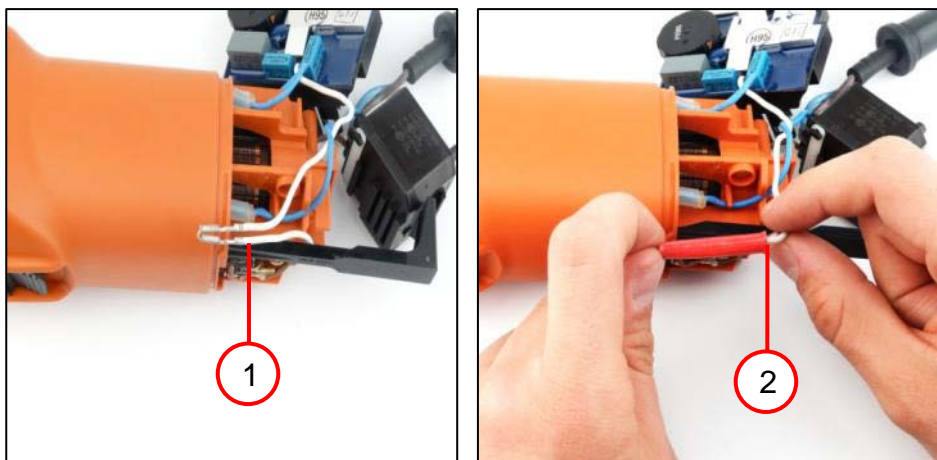
Tools:

- Assembly aid



7. Fitting

Fitting the switch and electronics



1. Connect the cables (1).
2. Slide on the insulating hose (2).



7. Fitting

Fitting the switch and electronics



1. Slide the switch (1) onto the motor housing.
 ☞ Pay attention to cable routing – see picture two.
2. Attach the electronics (2) to the switch until the lock engages.
3. Fit the control rod on the switch.
4. Fit the lower part of the cover (3).
5. Screw in the two screws (4) [1.5 Nm].
6. Position the cable with plug.
7. Fit the cable clamping piece (5).
8. Screw in the screw (6) [1.5 Nm].

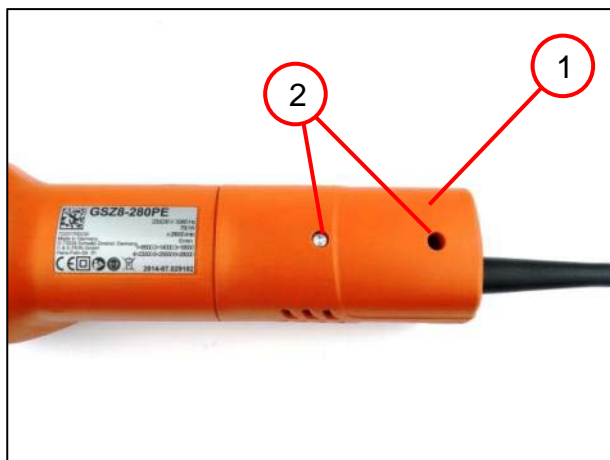
Tools:

- Torx T15



7. Fitting

Fitting the cover



1. Place the upper part of the cover (1) on the lower part of the cover.
2. Screw in the two screws (2) [1.5 Nm].

Please note!

The machine may be damaged if it is not given a running-in period.

- ☞ Up-to-date test data and test instructions after repair can be found on the FEIN Extranet (Customer Service → Repair Guides).

Tools:

- Torx T15



8. Connection diagram

Anschlussplan

Connection diagram

Esquemade conexiones

Schémade connexion

Схема соединёний

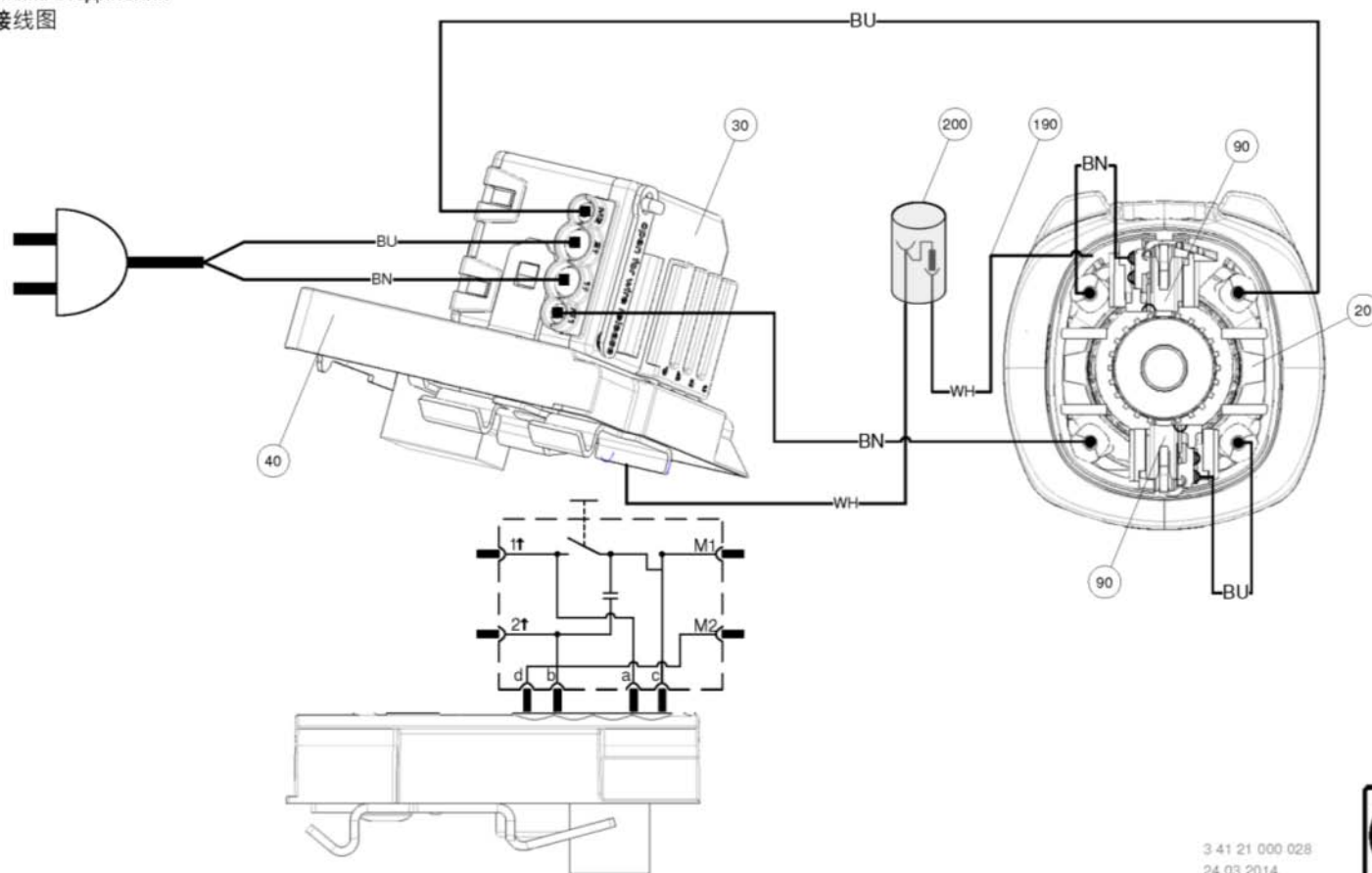
接线图

7 223 16 – GSZ8-280P / 100V – 110V 50/60Hz

7 223 18 – GSZ8-280PL / 100V – 110V 50/60Hz

7 223 16 – GSZ8-280P / 220V – 230V 50/60Hz

7 223 18 – GSZ8-280PL / 220V – 230V 50/60Hz



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8. Connection diagram

Anschlussplan

Connection diagram

Esquemade conexiones

Schéma connexion

Схема соединений

接线图

7 223 17 – GSZ8-280PE / 100V – 110V 50/60Hz

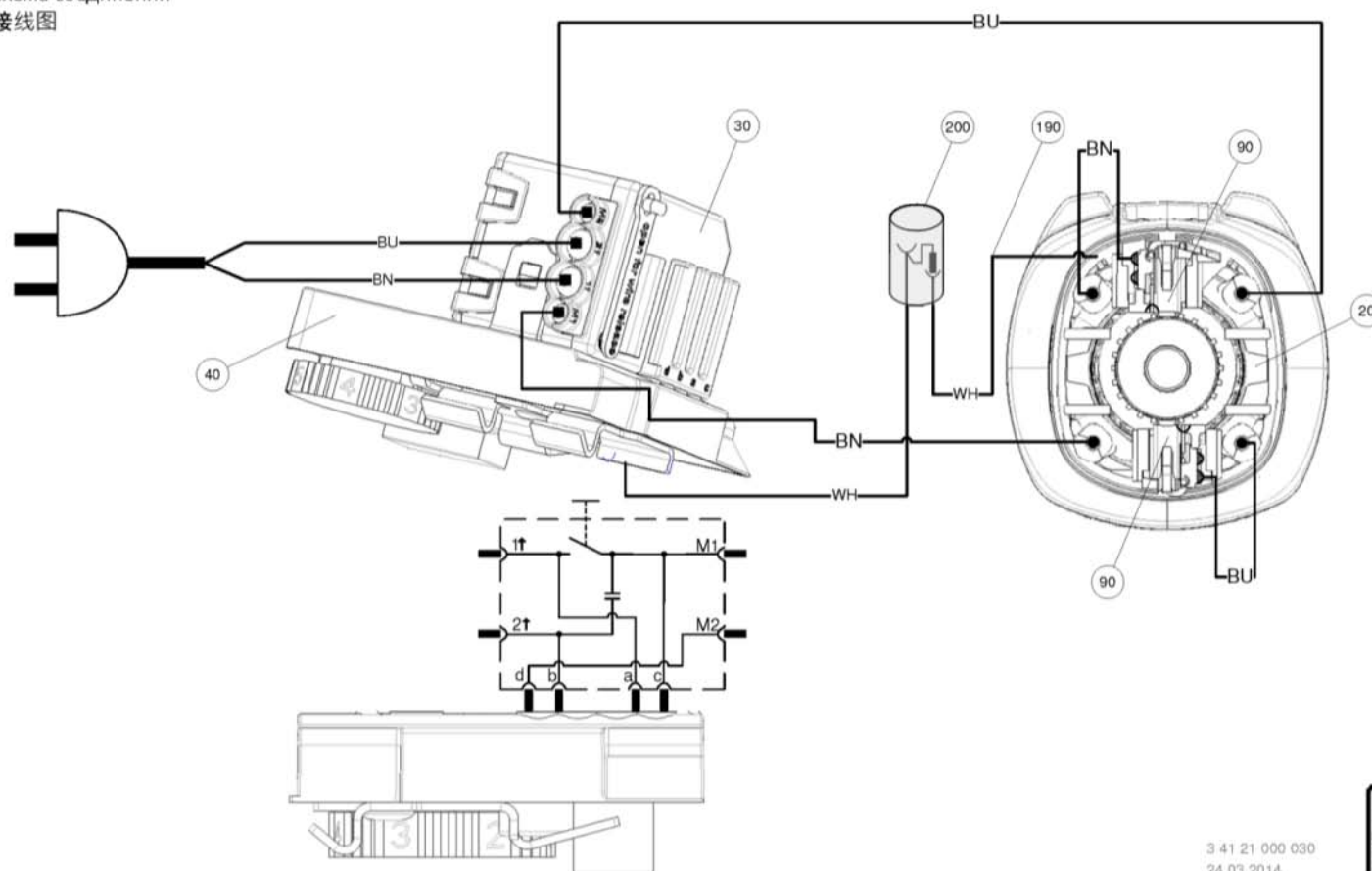
7 223 19 – GSZ8-280PEL / 100V – 110V 50/60Hz

7 223 20 – GSZ8-90PEL / 100V – 110V 50/60Hz

7 223 17 – GSZ8-280PE / 220V – 230V 50/60Hz

7 223 19 – GSZ8-280PEL / 220V – 230V 50/60Hz

7 223 20 – GSZ8-90PEL / 220V – 230V 50/60Hz



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